

U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LABORATORY TEST PROCEDURE

FOR

FMVSS No. 206

Door Locks and Door Retention Components

**Inertial Load Sled Test**



ENFORCEMENT  
Office of Vehicle Safety Compliance  
Room 6111, NVS-220  
400 Seventh Street, SW  
Washington, DC 20590

**OVSC TEST PROCEDURE TP-206I-00**  
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**REVISION CONTROL LOG  
FOR OVSC LABORATORY  
TEST PROCEDURES**

TP-206I

| TEST PROCEDURE |        | FMVSS 206 |                   | DESCRIPTION  |
|----------------|--------|-----------|-------------------|--|
| REV. No.       | DATE   | AMENDMENT | EFFECTIVE DATE    |  |
| 00             | 2/6/07 | 72FR5385  | September 1, 2009 | This procedure deals specifically with the inertial load test requirements of FMVSS No. 206. |
| 01             |        |           |                   |  |
| 02             |        |           |                   |  |
| 03             |        |           |                   |  |
| 04             |        |           |                   |  |
| 05             |        |           |                   |  |
| 06             |        |           |                   |  |
| 07             |        |           |                   |  |
| 08             |        |           |                   |  |
| 09             |        |           |                   |  |
| 10             |        |           |                   |  |
| 11             |        |           |                   |  |
| 12             |        |           |                   |  |

## 1. PURPOSE AND APPLICATION

The Office of Vehicle Safety Compliance (OVSC) is providing this Laboratory Test Procedure (TP) for the use of its contractor laboratories. The purpose of this TP is to provide guidelines for obtaining data in OVSC compliance testing programs and a uniform data recording format. This TP does not limit a laboratory's testing methods to the procedures specified in the TP or specific brands of testing equipment. However, any deviation from the TP's testing procedures or recommended testing equipment must be approved by the Contracting Officer's Technical Representative (COTR).

The data obtained in an OVSC compliance test are used to determine if the test specimen, a specific vehicle or item of motor vehicle equipment, meets the requirements specified in the TP. In some cases the TP does not include all of the various minimum performance requirements that are part of the associated Federal Motor Vehicle Safety Standard (FMVSS). Recognizing applicable test tolerances, the TP may specify test conditions that are less severe than the minimum requirements specified in the FMVSS.

If a contract laboratory views any part of the TP to be in conflict with the associated FMVSS or observes deficiencies in the TP, the contract laboratory shall advise the COTR and resolve the discrepancy prior to the start or resumption of compliance testing.

This specific test procedure, TP-206I-00, deals specifically with the inertial load test requirements of FMVSS No. 206.

**Legal Note:** The OVSC Test Procedures are prepared for the limited purpose of use by independent laboratories under contract to conduct compliance tests for the OVSC. The TP's are not rules, regulations or NHTSA interpretations regarding the FMVSS. The TP's are not intended to limit the requirements of the applicable FMVSS(s). In addition the TP's may be modified by the OVSC at any time without notice, and the COTR may direct or authorize contractors to deviate from these procedures, as long as the tests are performed in a manner consistent with the FMVSS itself and within the scope of the contract. TP's may not be relied upon to create any right or benefit in any person. Therefore, compliance of a vehicle or item of motor vehicle equipment is not guaranteed if the manufacturer limits its certification tests to those described in the TP.

## 2. GENERAL REQUIREMENTS

Federal Motor Vehicle Safety Standard (FMVSS) No. 206 establishes minimum performance requirements for motor vehicle door locks and door retention components. The purpose of FMVSS No. 206 is to minimize the likelihood of occupants being thrown from a vehicle as a result of impact. The standard applies to vehicle door locks and door retention components on side or back doors that lead directly into a compartment that contains one or more seating accommodations in passenger cars, multipurpose vehicles, and trucks, and in buses with a gross vehicle weight rating (GVWR) of 4,536 kg or less. The standard does not apply to folding doors, roll-up doors, detachable doors, and bus doors that are used only for emergency egress and labeled accordingly.

The TP-206I-00 procedure specifically provides requirements for compliance testing of motor vehicle hinged doors (side and back) and sliding side doors to the inertial load test requirements of FMVSS No. 206. The inertial load requirements for hinged doors and sliding side doors apply to each motor vehicle door latch system, including primary and auxiliary door latches. Table (1) below summarizes the inertial load test requirements specified in FMVSS No. 206.

| <b>Dynamic Acceleration Test</b> | <b>Inertial Load Pulse</b>         | <b>FMVSS 206 Section</b> | <b>Test Procedure Section</b> |
|----------------------------------|------------------------------------|--------------------------|-------------------------------|
| Vehicle                          | 30g for 30 msec per pulse corridor | S4.1.1.4                 | 12.1                          |
| Door Only                        | 30g for 30 msec per pulse corridor | S4.2.1.3                 | 12.2                          |

Table (1). FMVSS No. 206 Inertial Load Test Requirements

### 3. SECURITY

The contractor shall provide appropriate security measures to protect the OVSC test equipment from unauthorized personnel during the entire compliance-testing program. The contractor is financially responsible for any acts of theft and/or vandalism, which occur during the storage of test items. Any security problems, which arise, shall be reported by telephone to the Industrial Property Manager (IPM), Office of Contracts and Procurement, within two (2) working days after the incident. A letter containing specific details of the security problem will be sent to the IPM (with copy to the COTR) within 48 hours.

The contractor shall protect and segregate the data that evolves from compliance testing before and after each test. No information concerning the safety compliance-testing program shall be released to anyone except the COTR, unless specifically authorized by the COTR, the COTR's Division Chief, or by the Contracting Officer.

**NOTE: NO INDIVIDUALS, OTHER THAN CONTRACTOR PERSONNEL, SHALL BE ALLOWED TO WITNESS ANY COMPLIANCE TEST UNLESS SPECIFICALLY AUTHORIZED BY THE COTR.**

### 4. GOOD HOUSEKEEPING

Contractors shall maintain the entire equipment compliance testing area, test fixtures and instrumentation in a neat and clean condition with test instruments arranged in an orderly manner consistent with good test laboratory housekeeping practices.

### 5. TEST SCHEDULING AND MONITORING

The contractor shall submit a test schedule to the COTR prior to testing. Tests shall be completed as required in the contract. All testing shall be coordinated to allow monitoring by the COTR.

### 6. TEST DATA DISPOSITION

The contractor shall make all preliminary compliance test data available to the COTR on location within four hours after the test. Final test data, including digital printouts and computer generated plots (if applicable), shall be furnished to the COTR in accordance with the contract schedule.

All backup data sheets, strip charts, recordings, plots, technicians' notes, etc., shall be retained by the contractor for a minimum of one year after conclusion of each delivery order, purchase order, etc. The COTR shall direct final disposition at that time.

## 7. GOVERNMENT FURNISHED TEST ITEMS (GFTI)

### TEST VEHICLE ACCEPTANCE AND STORAGE

Upon receipt at the laboratory, the test vehicles shall be assigned laboratory test group numbers. The Contractor has the responsibility of accepting test vehicles from either new car dealers or vehicle transporters. In both instances, the Contractor acts in the OVSC's behalf when signing an acceptance of test vehicles. The Contractor must check to verify the following:

- A. All options listed on the "window sticker" are present on the test vehicle.
- B. Tires and wheel rims are the same as listed.
- C. There are no dents or other interior or exterior flaws.
- D. The vehicle has been properly prepared and is in running condition.
- E. The glove box contains an owner's manual, warranty document, consumer information, and extra set of keys.
- F. Proper fuel filler cap is supplied on the test vehicle.

The COTR must be notified within 24 hours after a vehicle has been delivered. The Contractor shall check for damage, which may have occurred during transit. A "Vehicle Condition" form will be supplied to the Contractor by the COTR when the test vehicle is transferred from the new car dealer or between test contracts. The upper half of the form describes the vehicle in detail, and the lower half provides space for a detailed description of the post-test condition. Vehicle Condition forms must be returned to the COTR with the copies of the Final Test Report or the reports will NOT be accepted. Also refer to the Data Sheet Section of this test procedure. The test vehicles shall be stored in a dry, clean, dust free area specifically designated by the Laboratory Project Manager.

## 8. CALIBRATION OF TEST INSTRUMENTS

Before the contractor initiates the safety compliance test program, a test instrumentation calibration system shall be implemented and maintained in accordance with established calibration practices. The calibration system shall include the following as a minimum:

- A. Standards for calibrating the measuring and test equipment will be stored and used under appropriate environmental conditions to assure their accuracy and stability.
- B. All measuring instruments and standards shall be calibrated by the contractor, or a commercial facility, against a higher order standard at periodic intervals NOT TO EXCEED TWELVE (12) MONTHS except for (a) static types of measuring devices such as rulers, weights, etc., which shall be calibrated at periodic intervals not to exceed two (2) years; and (b) accelerometers which shall be calibrated at periodic intervals not to exceed SIX (6) MONTHS, or after every FOUR (4) TESTS, or after a vehicle fails to meet the FMVSS No. 206 inertial load performance requirements, whichever occurs sooner. Records, showing the calibration traceability to the National Institute of Standards and Technology (NIST), shall be maintained

## 8. CALIBRATION OF TEST INSTRUMENTS.....CONTINUED

for all measuring and test equipment.

C. All measuring and test equipment and measuring standards will be labeled with the following information:

- (1) Date of calibration
- (2) Date of next scheduled calibration
- (3) Name of the technician who calibrated the equipment

D. A written calibration procedure shall be provided by the contractor which includes as a minimum the following information for all measurement and test equipment:

- (1) Type of equipment, manufacturer, model number, etc.
- (2) Measurement range
- (3) Accuracy
- (4) Calibration interval
- (5) Type of standard used to calibrate the equipment (calibration traceability of the standard must be evident)

E. Records of calibration for all test instrumentation shall be kept by the contractor in a manner that assures the maintenance of established calibration schedules. All such records shall be readily available for inspection when requested by the COTR. The calibration system need the acceptance by the COTR before the test program commences.

Further guidance is proved in the International Standard ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment" and American National Standard ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment – General Requirements."

## 9. PHOTOGRAPHIC DOCUMENTATION

### 9.1 Still Photographs

Each final test report shall include digital photographs (minimum size 8 x 10 inches) of the test setup used for each type of inertial load testing. Each report shall also include pre-test and post-test photographs of the specific item being tested. The photographs shall include a placard in view that identifies the test laboratory, the test date, test vehicle year, make and model, the specific FMVSS 206 test, and the words "Pre-Test" or "Post-Test" as appropriate.

### 9.2 Video Coverage

Each vehicle and door(s) only inertial load test shall be recorded with a digital video camera fully documenting the pre-test door closure procedure specified in section 12.1.4 (m) and section 12.2.4 (e) as applicable. Each vehicle inertial load test shall also include digital video recordings fully documenting the post-test door pull procedure specified in section 12.1.6 (d). The video coverage shall include a placard in view that identifies the test laboratory, the test date, test vehicle year, make and model, the specific FMVSS 206 test, and the words "Pre-Test" or "Post-Test" as appropriate.

### 9.3 Inertial Load Sled Test High-Speed Camera Coverage

Each vehicle and door(s) only inertial sled test (see sections 12.1 and 12.2, respectively) shall be documented with high-speed color 16 mm cameras, or with high-speed color digital video cameras. Digital video cameras are preferable. Film and digital files shall be provided, as a part of the final test report, on a compact disc(s) as AVI or MPEG file format. Other types of files can be used if approved by the COTR. When using film, the film shall be scanned in at a resolution of 1920 x 1035 pixels. Other scanned film resolutions can be used if approved by the COTR. Additional camera requirements for each test are specified below:

- (a) For each vehicle transverse sled test, one onboard (onboard the acceleration sled / vehicle carriage) high-speed camera is required for each hinged side door and each sliding side door of the vehicle. The cameras shall be mounted outside the vehicle and shall be positioned such that they clearly record the position of the opening edge of the door relative to the vehicle body.

In addition, each test shall include a minimum of one off-board camera for each vehicle back door. The cameras shall be positioned such that they clearly record the position of the opening edge of the door relative to the vehicle body.

The cameras are required to record any hinged door opening (including back doors) and sliding side door opening during each vehicle inertial sled test.

## 9. PHOTOGRAPHIC DOCUMENTATION.....CONTINUED

- (b) For each vehicle longitudinal sled test, a minimum of one off-board camera shall be required for hinged side and back door, and each sliding side door of the vehicle. The cameras shall be positioned such that they clearly record the position of the opening edge of the door relative to the vehicle body.

The cameras are required to record any hinged door opening (including back doors) and sliding side door opening during each vehicle inertial sled test.

- (c) For each door(s) only sled test, a minimum of one onboard high-speed camera is required for each door being tested. The cameras shall be positioned such that they clearly record the door latch and striker interface.
- (d) Vehicle identification placards shall be positioned so that at least 1 placard will be visible in the field-of-view for each of the cameras. The following information will be shown:
- i. Vehicle's NHTSA Number
  - ii. FMVSS 206 inertial load sled test  
(specify vehicle or specific door(s), and test orientation(s))
  - iii. Date of test
  - iv. Name of contract laboratory
  - v. Vehicle year, make and model
- (e) The cameras shall operate at 250 frames per second (minimum) for at least 10 ms before the sled is accelerated and for at least 310 ms after the sled acceleration pulse is completed.
- (f) For high-speed color 16 mm cameras:  
High-speed motion picture cameras shall record on 16 mm color negative film. A timing mark must be registered on the film edge a minimum of every 10 ms and a time zero impact mark must be registered on the film to indicate time zero (0.5 g) of the acceleration pulse for the specific inertial sled test.
- (g) For high-speed color digital video cameras (preferred):  
The minimum resolution for these cameras shall be 1536 CMOS sensors per every two rows of pixels, with 80% of the horizontal distance of the two rows covered by effective light sensors. There shall be a minimum of 1024 rows of sensors. Cameras that do not meet these specifications may be used if approved by the COTR.

A time zero impact mark must be registered in a frame to indicate time zero (0.5 g) of the acceleration pulse for the specific inertial sled test. Each frame shall contain the camera speed and the frame number beginning with the time zero frame labeled as "Frame 0." The frame numbers prior to time zero shall be negative numbers.

## 9. PHOTOGRAPHIC DOCUMENTATION.....CONTINUED

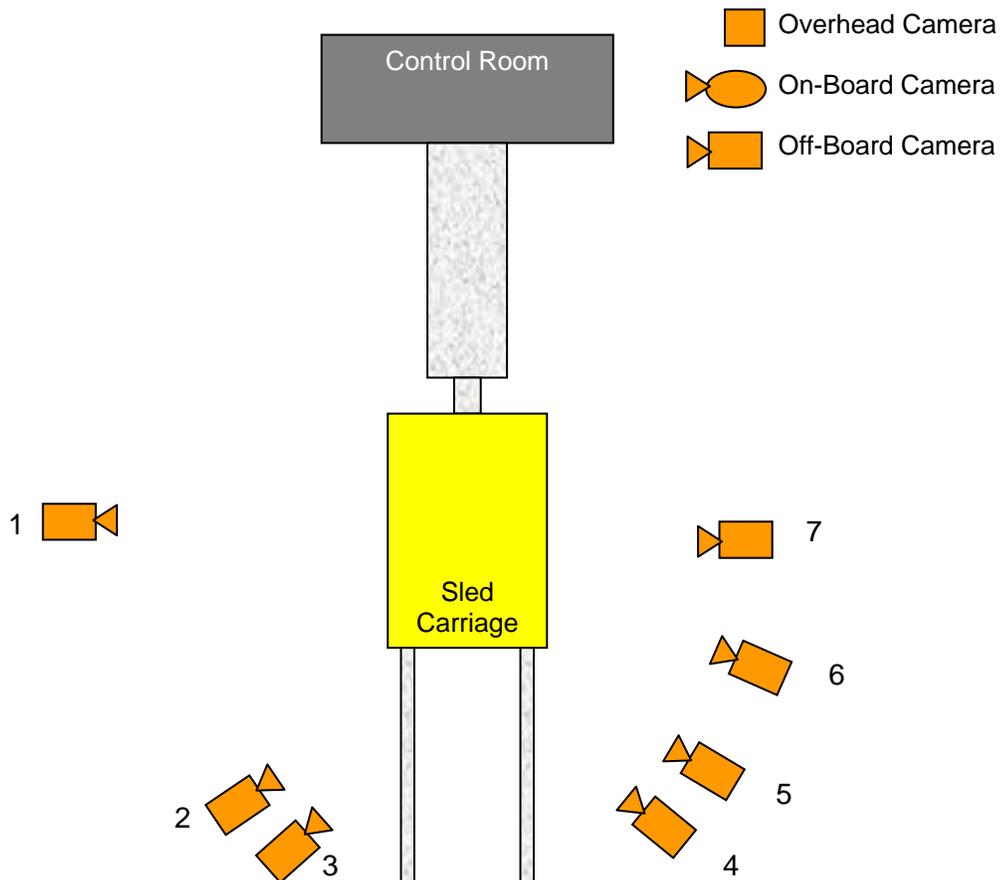
### (h) Typical Vehicle High-Speed Camera Locations

Typical high-speed camera locations for vehicle longitudinal and transverse sled testing are described in Figures 1 and 2 respectively. (Typical vehicle with 4 side doors and one back door).

**FIGURE 1. CAMERA LOCATIONS – LONGITUDINAL TEST**

| CAMERA NO. | VIEW                    |
|------------|-------------------------|
| 1          | Left Side View Overall  |
| 2          | Left Front Door View*   |
| 3          | Left Rear Door View *   |
| 4          | Right Rear Door View*   |
| 5          | Right Front Door View*  |
| 6          | Back Door View*         |
| 7          | Right Side View Overall |

\* Minimum Required

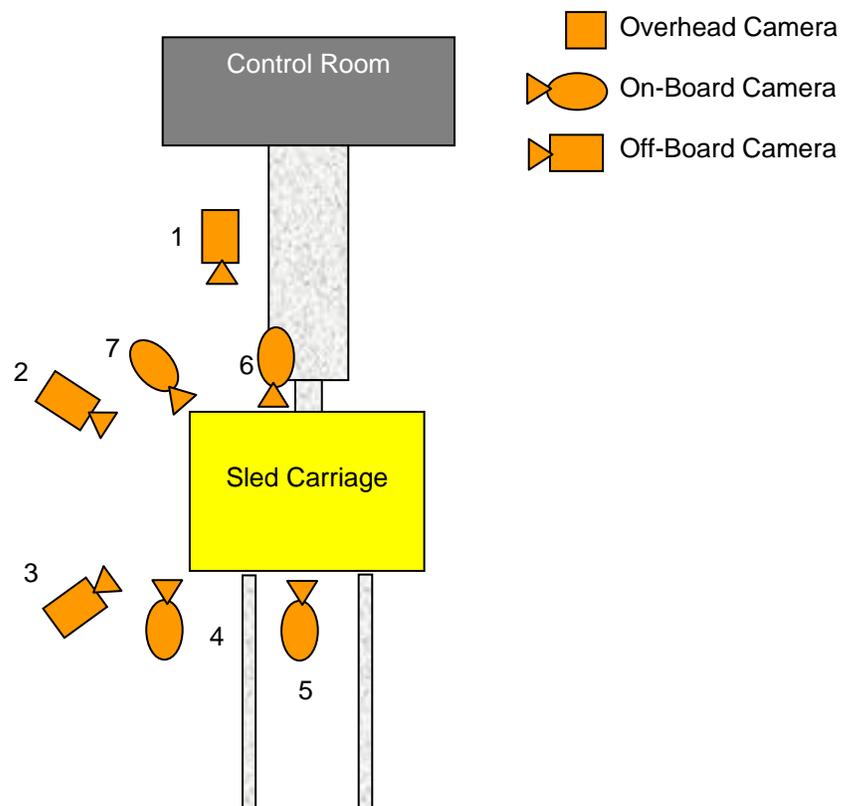


## 9. PHOTOGRAPHIC DOCUMENTATION.....CONTINUED

FIGURE 2. CAMERA LOCATIONS – TRANSVERSE TEST

| CAMERA NO. | VIEW                      |
|------------|---------------------------|
| 1          | Back Door View Overall*   |
| 2          | Left Side Rear View       |
| 3          | Right Side Rear View      |
| 4          | Right Rear Door Onboard*  |
| 5          | Right Front Door Onboard* |
| 6          | Left Front Door Onboard*  |
| 7          | Left Rear Door Onboard*   |

\* Minimum Required



## 9. PHOTOGRAPHIC DOCUMENTATION.....CONTINUED

### (i) Vehicle Reference Targets

Photographic targets shall be firmly bonded onto the test vehicle. The targets shall be affixed in pairs located parallel to each other on each side of the vertical opening edge of each door, and as close to the door gap as possible. For each door, the target pairs shall be affixed near the upper portion of the door (just under the window sill for a hinged side door), near the mid portion of the door along the vehicle body, and near the bottom portion of the door, at a minimum. Typical target locations for hinged side doors are shown below in Figure 3.



Figure 3. Typical Target Locations for Hinged Side Doors

## 10. DEFINITIONS

Auxiliary Door Latch is a latch equipped with a fully latched position, with or without a secondary latched position, and fitted to a door or door system equipped with a primary door latch system.

Auxiliary Door Latch System consists of door latches and strikers other than those associated with the primary latch system.

Back Door is a door or door system on the back end of a motor vehicle through which passengers can enter or depart the vehicle or cargo can be loaded or unloaded. It does not include:

A trunk lid; or

A door or window composed entirely of glazing material and whose latches and/or hinge systems are attached directly to the glazing material.

Designated Seating Capacity means the number of designated seating positions provided.

Door Latch System consists of latches and strikers installed on a door system.

Door System is the door, latch, striker, hinges, sliding track combinations and other door retention components on a door and its surrounding doorframe. The door system of a double door includes both doors.

Double Door is a system of two doors where the front door or wing door opens first and connects to the rear door or bolted door, which opens second.

Folding Door is a movable barrier, which will close off an entranceway to a bus, multipurpose passenger vehicle or truck, consisting of two or more hinge panels that swing, slide, or rotate; does not have a striker and latch assembly

Fully Latched Position is the coupling condition of the latch that retains the door in a completely closed position.

Gross Axle Weight Rating (GAWR) means the value specified by the vehicle manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.

Gross Vehicle Weight Rating (GVWR) means the value specified by the manufacturer as the loaded weight of a single vehicle.

Latch is a device employed to maintain the door in a closed position relative to the vehicle body with provisions for deliberate release (or operation).

Primary Door Latch is a latch equipped with both a fully latched position and a secondary latched position and is designated as a "primary door latch" by the manufacturer (by the time it certifies the vehicle and may not thereafter alter the designation).

## 10. DEFINITIONS....CONTINUED

Primary Door Latch System consists of a primary door latch(s) and a striker(s).

Secondary Latched Position refers to the coupling condition of the latch that retains the door in a partially closed position.

Striker is a device with which the latch engages to maintain the door in the fully latched or secondary latched position.

Trunk Lid is a movable body panel that provides access from outside the vehicle to a space wholly partitioned from the occupant compartment by a permanently attached partition or fixed or fold-down seat back.

Unloaded Vehicle Weight (UVW) means the weight of a vehicle with maximum capacity of all fluids necessary for operation of the vehicle, but without cargo, occupants, or accessories that are ordinarily removed from the vehicle when they are not in use.

Vehicle Capacity Weight (VCW) means the rated cargo and luggage load plus 68 kilograms times the vehicle's designated seating capacity.

## 11. PRETEST REQUIREMENTS

### 11.1 IN-HOUSE TEST PROCEDURE

Every contractor is required to submit a detailed in-house test procedure to the COTR before initiating the compliance test program. The procedure must include a step-by-step description of the methodology to be used. The contractor's test procedure shall contain a detailed check-off sheet and a complete listing of test equipment with makes and model numbers. The list of test equipment shall include instrument accuracy and calibration dates. There shall be no contradictions between the OVSC Laboratory Test Procedure and the contractor's in-house procedure without COTR agreement. The procedures shall cover all aspects of testing from vehicle receipt to submission of the final report. Written approval of the in-house test procedure and all subsequent revisions shall be obtained from the COTR. The in-house procedure shall include the following:

- A. A step-by-step description of the methodology and test procedure to be used.
- B. A written Quality Control (QC) procedure which shall include calibrations, the data review process, report review, and the people assigned to perform QC per task.
- C. A complete listing of test equipment which shall include instrument accuracy and calibration dates.
- D. Detailed check-off lists to be used during the test and during data review. These lists shall include all test procedure requirements and FMVSS requirements pertaining to the safety standard for which testing is being performed. Each separate check-off sheet shall identify the lab, test date, vehicle and test technicians. These check sheets shall be used to document that all requirements and procedures have been complied with. These sheets shall be submitted with the test report.

### 11.2 INSTRUMENTATION AND DATA ACQUISITION

#### 11.2.1 Vehicle Inertial Load Sled Test

The acceleration sled platform shall be instrumented with an accelerometer and data processing system that conforms to the requirements specified in Society of Automotive Engineers (SAE) Recommended Practice J211 December 2003, "Instrumentation for Impact Test – Part 1 – Electronic Instrumentation", Channel Class 60. The accelerometer sensitive axis shall be parallel to the direction of test platform travel. A primary and secondary (back-up) accelerometer shall be used for each sled test.

#### 11.2.2 Door Only Inertial Load Sled Test

The acceleration sled platform shall be instrumented with an accelerometer and data processing system that conforms to the requirements specified in SAE Recommended Practice J211 December 2003, "Instrumentation for Impact Test – Part 1 – Electronic Instrumentation", Channel Class 60. The accelerometer sensitive axis shall be parallel to the direction of test platform travel. A primary and secondary (back-up) accelerometer shall be used for each sled test.

## 11. PRETEST REQUIREMENTS...CONTINUED

### 11.3 TEST DATA LOSS

A compliance test is not to be conducted unless all of the various test conditions specified in the applicable OVSC Laboratory Test Procedure have been met. Failure of a contractor to obtain the required test data and to maintain acceptable limits on test parameters in the manner outlined in the applicable OVSC Laboratory Test Procedure may require a retest at the expense of the contractor. The retest costs will include the cost of a replacement test vehicle (if deemed necessary by the COTR), and all costs associated with conducting the retest. If a replacement test vehicle is deemed necessary, it shall be the same model year, make, model, and equipped as the original test vehicle. The original test vehicle used for the invalid test shall remain the property of OVSC, and the retest vehicle shall remain the property of the contractor. If there is a test failure, the contractor shall retain the retest vehicle for a period specified by the COTR not exceeding two (2) years.

The Contracting Officer is the only NHTSA official authorized to notify the contractor that a retest is required. The retest shall be completed within two (2) weeks after receipt of the replacement vehicle (if deemed necessary), and notification by the Contracting Officer that a retest is required, whichever is later. If a retest is conducted, no test report is required for the original test.

### 11.4 TEST CONDITIONS

Unless otherwise specified, all tests and measurements shall be conducted under the following environmental conditions:

- A. Temperature:  $70^{\circ}\text{F} \pm 5^{\circ}\text{F}$  ( $21^{\circ}\text{C} \pm 3^{\circ}\text{C}$ )
- B. Relative Humidity:  $50\% \pm 10\%$
- C. Atmospheric Pressure: 28 to 32 inches (711 mm to 813 mm) of mercury

Continuous recording of environmental temperature and relative humidity of the testing area shall be conducted during all tests. Test vehicles, unless otherwise specified, shall be stabilized at test room ambient conditions for a period of at least 24 hours immediately prior to testing.

## 11. PRETEST REQUIREMENTS....Continued

### 11.5 TEST PERSONNEL PERFORMANCE

Personnel supervising and/or performing the compliance test program shall be thoroughly familiar with the requirements, test conditions, equipment for the test to be conducted, and safety requirements.

### 11.6 RECORDING OF TEST DATA

Environmental data and test data shall be recorded on permanent strip charts, circular recording charts, or other print-out media, and/or analog or digital data recording devices acceptable to the COTR. Where permanent trace recording is not required, data will be recorded on standard report forms. Changes or corrections shall be made by drawing a line through the original entry, which must still remain legible, and adding the change alongside.

Data will be submitted on the Test Data Sheet forms specified for use in the final test report. Data will be typed before the sheets are submitted. One set of Inspection and Test Data sheets shall be completed for each vehicle.

## 12. COMPLIANCE TEST EXECUTION

### 12.1 VEHICLE INERTIAL LOAD SLED TEST

#### 12.1.1 Vehicle Preparation Building

Vehicle preparation shall be performed in a building that is large enough to house the test vehicle and allow for government, vehicle manufacturer, and laboratory personnel to easily move around the test vehicle.

#### 12.1.2 Sled System

The sled test equipment shall be housed in a temperature-controlled building that is large enough to house the test vehicle and allow for government, vehicle manufacturer, and laboratory personnel to move around the test vehicle. The building climate control must be capable of maintaining the ambient air temperature between 65°F and 75°F (18°C to 24°C).

With the vehicle (for buses, maximum Gross Vehicle Weight Rating (GVWR) of 4536 kg) rigidly secured to the acceleration device, the sled system must be capable of ensuring that when accelerated together, all points on the recorded crash pulse curve are within the acceleration corridor defined in Table 2 and Figure 4.

12. COMPLIANCE TEST EXECUTION...Continued

| Upper Bound |           |                  | Lower Bound |           |                  |
|-------------|-----------|------------------|-------------|-----------|------------------|
| Point       | Time (ms) | Acceleration (g) | Point       | Time (ms) | Acceleration (g) |
| A           | 0         | 6                | E           | 5         | 0                |
| B           | 20        | 36               | F           | 25        | 30               |
| C           | 60        | 36               | G           | 55        | 30               |
| D           | 100       | 0                | H           | 70        | 0                |

Table 2 – Acceleration Pulse Corridor

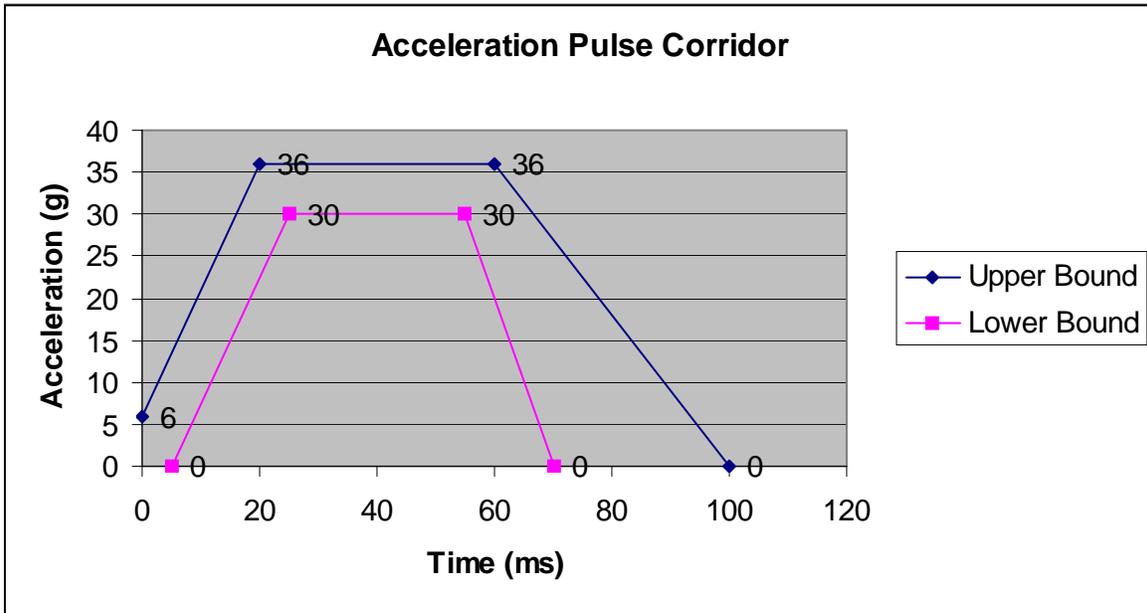


Figure 4

12.1.3 Vehicle Attitude

Vehicle Pitch

When the vehicle is in its “as delivered” condition measure the angle of the driver’s door sill. Mark the location where the angle is taken on the door sill. When the vehicle is in its “loaded” condition, measure the angle of the driver’s door sill at the same location the “as delivered” angle was measured. When the vehicle is secured to the acceleration sled (see section 12.1.4), the vehicle pitch attitude on the sled, determined by the door sill angle, should be between the “as delivered” and the “loaded” condition. The vehicle “as delivered” and “loaded” conditions are defined below.

## 12. COMPLIANCE TEST EXECUTION...Continued

### Vehicle Roll

Mark a point on the vehicle body centered near the top of the front wheel well on each side of the vehicle. From a level surface, measure the vertical distance to each marked location on the front wheel wells when the vehicle is in the "as delivered" or "loaded" condition. When the vehicle is secured to the acceleration sled (see section 12.1.4), measure the vertical distance from the top surface of the sled to each marked location on the front wheel wells. The distance between the two corresponding measurements for each front wheel well shall be within 25.4 mm (1 inch) of each other. The vehicle "as delivered" and "loaded" conditions are defined below.

### As Delivered Condition

The "as delivered" condition is the vehicle as received at the test site, with 100 percent of all fluid capacities (i.e. unloaded vehicle weight (UVW)), and all tires inflated to the manufacturer's specifications as listed on the vehicle's tire placard.

### Loaded Condition - Passenger Car

A passenger car shall be loaded to its UVW plus its rated cargo and luggage capacity weight (RCLW) in the luggage area, plus the weight of two 50th-percentile adult male test dummies (156 kg (344 lb)) distributed equally at the front outboard designated seating positions.

The FMVSS 110 requires that the maximum combined weight of occupants and cargo (i.e. vehicle capacity weight (VCW)) and the seating capacity (i.e. designated seating capacity (DSC)) be recorded on the vehicle placard. (Check the number of restraints provided in the vehicle against the DSC. Inform the COTR immediately if they do not match.) This information can be used to determine the "rated cargo and luggage weight" (RCLW) as follows:

$$\text{RCLW} = \text{VCW} - (68 \text{ kg (150 lb)} \times \text{DSC})$$

### Loaded Condition - Multipurpose Passenger Vehicles, Trucks and Buses

A multipurpose passenger vehicle (MPV), truck or bus is loaded to its UVW, plus 300 pounds or its RCLW, whichever is less, plus the weight of two 50th-percentile adult male test dummies (156 kg (344 lb)) distributed equally at the front outboard designated seating positions.

Where the VCW is not provided on a label similar to the FMVSS 110 placard, it can be calculated by the following formula:

$$\text{VCW} = \text{GVWR} - \text{UVW}$$

$$\text{RCLW} = \text{VCW} - (68 \text{ kg (150 lb)} \times \text{DSC})$$

## 12. COMPLIANCE TEST EXECUTION...Continued

The scales used to weigh the test vehicle shall be accurate to within  $\pm 0.1\%$ . The vehicle pitch angle measurements shall be accurate to within  $\pm 0.5$  degree, and the vehicle roll measurements shall be accurate to within  $\pm 1$  mm.

### 12.1.4 Vehicle Preparation

- (a) Drain the fuel system and operate the engine until the fuel system is dry. Drain all other fluids from the test vehicle.
- (b) Disconnect the air bags.
- (c) Remove wheels from the vehicle.
- (d) Rigidly attach the vehicle to the sled interface frame or sled so that movement between the base of the vehicle and the test platform is prevented. (In other words, when accelerated together, the recorded crash pulse curve is within the acceleration corridor defined in Table 2 and Figure 4.) Mount the vehicle as low as possible on the sled in order to keep the center of gravity as low as possible.
- (e) Rigidly attach the engine, transmission, axles, and exhaust system to the vehicle body, vehicle frame, interface frame, or sled. The suspension should be welded or removed. (Alternatively, vehicle preparation may remove the engine and other components in the engine compartment, transmission, axles, and exhaust system while retaining all of the vehicle "body" components). Door trim and panels shall not be removed. If the vehicle has a frame, rigidly attach the body to the frame.
- (f) If the vehicle is not attached directly to the sled, rigidly attach the vehicle/interface frame unit to the sled.
- (g) Verify that the vehicle attitude when secured to the acceleration sled complies with the requirements specified in section 12.1.3.
- (h) Remove the battery from the vehicle.
- (i) Convertibles and open-body type vehicles have the top, if any, in place in the closed passenger compartment configuration.
- (j) The hood, hood latches, and any other hood retention components are engaged.
- (k) To facilitate the post-test door fully latched assessment specified in section 12.1.6, any attachment device required to be affixed to the door shall be applied to each door prior to conducting the inertial sled test. Each device shall be affixed on the exterior of each door at a point that is along the horizontal centerline of the door latch, and that is 76 mm (3 inches) ( $\pm 1$  cm (0.4 in)) from the edge of the door containing the latch.
- (l) Close all windows.

## 12. COMPLIANCE TEST EXECUTION...Continued

- (m) Close all doors and ensure that each door latch is in the fully latched position, and that each door is unlocked. This shall be documented as specified in section 9.2.
- (n) Verify the required instrumentation per section 11.2.1.
- (o) Install the required high-speed cameras for recording any door opening as specified in section 9.3. Affix the reference targets as specified in section 9.3 (i).

### 12.1.5 Vehicle Sled Test

- (a) Conduct the vehicle sled test as required per the following test orientations as applicable:
  - (1) Longitudinal Setup # 1:  
Orient the vehicle so that its longitudinal axis is aligned with the axis of the acceleration sled, simulating a frontal impact (i.e., vehicle is accelerated in the rearward direction).
  - (2) Longitudinal Setup # 2:  
Orient the vehicle so that its longitudinal axis is aligned with the axis of the acceleration sled, simulating a rear impact (i.e., vehicle is accelerated in the forward direction).
  - (3) Transverse Setup # 1:  
Orient the vehicle so that its transverse axis is aligned with the axis of the acceleration sled, simulating a driver side impact (i.e., vehicle is accelerated with the passenger side of the vehicle leading the direction of acceleration).
  - (4) Transverse Setup # 2:

**Note:** Only for vehicles having different door arrangements on each side.

Orient the vehicle so that its transverse axis is aligned with the axis of the acceleration sled, simulating a side impact in the direction opposite to that specified in section 12.1.5 (a) (3) above (i.e., vehicle is accelerated with the driver side of the vehicle leading the direction of acceleration).

## 12. COMPLIANCE TEST EXECUTION....Continued

- (b) Conduct the vehicle sled test for each applicable vehicle orientation specified in section 12.1.5 (a). For each vehicle sled test, maintain a minimum acceleration level of 30 g for a period of at least 30 ms, while keeping the acceleration within the pulse corridor defined in Table 2 and Figure 4. Time zero shall be taken as 0.5 g.

Note: Normally the recorded acceleration must be within the acceleration pulse corridor defined in Table 2 and Figure 4 in order for the test to be valid. However, if at any point in time during the test the pulse exceeds 36 g and the test requirements are fulfilled, the test shall be considered valid.

- (c) Note: Except as noted in section 12.1.5 (b) above, the recorded acceleration for each sled test must be within the acceleration pulse corridor defined in Table 2 and Figure 4. In order to adjust for different sled systems, the curve may be shifted with respect to time to obtain this result. If the curve is shifted, report the specific time shift.

- (d) After each vehicle sled test:

- (1) Visually inspect the vehicle for evidence of any door opening and record results. (Data Sheet No. 1).
- (2) Thoroughly review the high-speed camera records for evidence of any door opening and record results. (Data Sheet No. 1).

- (e) For each vehicle sled test, a copy of the recorded acceleration shall be plotted against the acceleration pulse corridor shown in Figure 4 and included in the Final Report.

## 12. COMPLIANCE TEST EXECUTION...Continued

### 12.1.6 Post-Test Door Fully Latched Assessment

- (a) For side doors, apply a horizontal force of 270 N ( $\pm 10$  N) perpendicular ( $\pm 10^\circ$ ) to the longitudinal centerline of the vehicle in the door opening direction. For sliding side doors, apply a horizontal force of 270 N ( $\pm 10$  N) at 45 degrees ( $\pm 10^\circ$ ) to the longitudinal centerline of the vehicle in the door opening/sliding direction. For back doors, apply a horizontal force of 270 N ( $\pm 10$  N) perpendicular ( $\pm 10^\circ$ ) to the transverse centerline of the vehicle in the door opening direction. (The door opening direction for hinged doors refers to the initial direction that the door will move when opening along its swing path.)
- (b) The horizontal force shall be applied by a loading device attached to the exterior of each door at a point that is along the horizontal centerline of the door latch (along the vertical centerline of the door latch for back doors that open upward), and that is 102 mm (4 inches) ( $\pm 10$  mm (0.4 in)) from the edge of the door containing the latch.
- (c) The device shall apply the load to the exterior of the door by a means approved by the COTR.
- (d) While the horizontal force is applied, digital video coverage shall be taken as specified in section 9.2 to clearly document any opening of the door. The door shall be considered to fail if the door does not remain fully latched. (Data Sheet No. 1).

## 12. COMPLIANCE TEST EXECUTION...Continued

### 12.2 DOOR ONLY INERTIAL LOAD SLED TEST

#### 12.2.1 Vehicle Preparation and Door Removal Building

Vehicle preparation and door removal shall be performed in a building that is large enough to house the test vehicle and allow for government, vehicle manufacturer, and laboratory personnel to move around the test vehicle.

#### 12.2.2 Sled System

The sled test equipment shall be housed in a temperature-controlled building that is large enough to house the door test fixture (with up to five doors properly attached for testing) and allow for government, vehicle manufacturer, and laboratory personnel to move around the test sled. The building climate control must be capable of maintaining the ambient air temperature between 65°F and 75°F (18°C and 24°C).

With the test fixture and door(s) rigidly secured to the acceleration device, the sled system must be capable of ensuring that when accelerated together, all points on the recorded crash pulse curve are within the acceleration corridor defined in Table 2 and Figure 4.

#### 12.2.3 Vehicle Preparation and Door Removal

Prior to removal of the vehicle door(s) for testing, the vehicle attitude shall be determined as specified in section 12.1.3. With the vehicle attitude between the "as delivered" and "fully loaded" condition, inclusive, identify and record the relative locations of the hinge mounting points and the striker mounting points for each door using a 3-D positioning arm (or equivalent device to accurately record 3-D coordinates).

Carefully remove each door to be tested from the vehicle and retain all mounting bolts for reassembling each door to the test fixture. Any wire or cabling connecting the door to the vehicle can be severed at the door. Each removed door shall be considered a "door subsystem". Ensure that each door subsystem maintains, at a minimum, the door latch(es), exterior door handle(s) with mechanical latch operation, interior door opening lever(s), and locking device(s), either separately or combined to a test fixture.

#### 12.2.4 Door Test Fixture Setup

- (a) Each door only sled test may be configured to test multiple doors at different or similar orientations.

## 12. COMPLIANCE TEST EXECUTION...Continued

- (b) The test fixture for mounting the door(s) shall be constructed with mounting surfaces for the door upper and lower hinges, and for the door striker. Securely attach each door to be tested to the test fixture using the proper bolts and 3-D positioning data obtained before removal of the doors from the vehicle per section 12.2.3. Each door and striker shall be mounted to the test fixture to correspond to its orientation on the vehicle, and to the directions specified in section 12.2.5 as appropriate.
- (c) Rigidly attach the assembled door(s) test fixture to the acceleration sled such that, when accelerated together, the recorded crash pulse curve is within the acceleration corridor defined in Table 2 and Figure 4.
- (d) Ensure that all windows are closed.
- (e) Close all doors and ensure that each door latch is in the fully latched position, and that each door is unlocked. This shall be documented as specified in section 9.2.
- (f) Verify the required instrumentation per section 11.2.2.
- (g) Install the required high-speed cameras for recording any door opening as specified in section 9.3.

### 12.2.5 Door Sled Test

- (a) Conduct the door sled test as required per the following test orientations as applicable:
  - (1) Longitudinal Setup 1:  
Orient the door subsystem(s) on the acceleration device in the direction of a frontal impact.
  - (2) Longitudinal Setup 2:  
Orient the door subsystem(s) on the acceleration device in the direction of a rear impact.
  - (3) Transverse Setup 1:  
Orient the door subsystem(s) on the acceleration device in the direction of a driver-side impact.
  - (4) Transverse Setup 2:  
Orient the door subsystem(s) on the acceleration device in the direction opposite to that described in section 12.2.5 (a) (3).

## 12. COMPLIANCE TEST EXECUTION...Continued

(5) Vertical Setup 1 (only for back doors that open upward):

Orient the door subsystem(s) on the acceleration device so that its vertical axis (when mounted in the vehicle) is aligned with the axis of the acceleration device, simulating a rollover impact where the force is applied in the direction from the top to the bottom of the door (when mounted in a vehicle).

(6) Vertical Setup 2 (only for back doors only that open upward):

Orient the door subsystem(s) on the acceleration device so that its vertical axis (when mounted in the vehicle) is aligned with the axis of the acceleration device, simulating a rollover impact where the force is applied in the direction opposite to that described in section 12.2.5 (a) (5).

(b) Conduct the door(s) sled test for each applicable orientation specified in section 12.2.5 (a). For each door sled test, maintain a minimum acceleration level of 30 g for a period of at least 30 ms, while keeping the acceleration within the pulse corridor defined in Table 2 and Figure 4. Time zero shall be taken as 0.5 g.

Note: Normally the recorded acceleration must be within the acceleration pulse corridor defined in Table 3 and Figure 8 in order for the test to be valid. However, if at any point in time during the test the pulse exceeds 36 g and the test requirements are fulfilled, the test shall be considered valid.

(c) Note: Except as noted in section 12.2.5 (b) above, the recorded acceleration for each sled test must be within the acceleration pulse corridor defined in Table 2 and Figure 4. In order to adjust for different sled systems, the curve may be shifted with respect to time to obtain this result. If the curve is shifted, report the specific time shift.

(d) After each door sled test:

(1) Visually inspect each door tested for evidence of any door opening (while verifying that each door is fully latched) and record results. (Data Sheet No. 1).

(2) Thoroughly review the high-speed camera records for evidence of any door opening and record results. (Data Sheet No. 1).

(e) For each door sled test, a copy of the recorded acceleration shall be plotted against the acceleration pulse corridor shown in Figure 4 and included in the Final Report.

### **13. POST TEST REQUIREMENTS**

The contractor shall re-verify all instrumentation and check data sheets and photographs. Make sure data is recorded in all data blocks on every compliance test data sheet.

## 14. REPORTS

### 14.1 MONTHLY STATUS REPORTS

The contractor shall submit a monthly Test Status Report and an Equipment Status Report to the COTR by the 8<sup>th</sup> day of the month. The Equipment Status Report shall be submitted until all final reports are accepted. A sample of the required Monthly Status Report is contained in the report forms section.

### 14.2 APPARENT TEST FAILURE

Any indication of a test failure shall be communicated by telephone to the COTR within one (1) working day with written notification mailed within two (2) working days. A Notice of Test Failure (see report forms section) with a copy of the particular compliance test data sheet(s) shall be included.

In the event of a test failure, a post-test calibration check of some critically sensitive test equipment and instrumentation may be required for verification of accuracy. The necessity for the calibration shall be at the COTR's discretion and shall be performed without additional costs to the OVSC.

### 14.3 FINAL TEST REPORTS

#### 14.3.1 COPIES

Two hard copies of each Final Test Report and one electronic copy shall be submitted to the COTR for acceptance within two weeks of test completion. The Final Test Report format to be used by all contractors is specified in the following subsections, and sample Data Sheet formats are included in section 15. The electronic copy shall be submitted on Compact Disc Recordable (CDR) in Microsoft Soft (MS) Word format and Portable Document Format (PDF), or the electronic copy may be emailed directly to the COTR.

Payment of contractor's invoices for completed compliance tests may be withheld until the Final Test Report is accepted by the COTR. Contractors are requested to NOT submit invoices before the COTR is provided copies of the Final Test Report.

Contractors are required to submit the first Final Test Report in typed draft form within two (2) weeks after the compliance test is conducted. The contractor and the COTR will then be able to discuss the details of both test conduct and report content early in the compliance test program.

Contractors are required to PROOF READ all Final Test Reports before submittal to the COTR. The OVSC will not act as a report quality control office for contractors. Reports containing a significant number of errors will be returned to the contractor for correction, and a "hold" will be placed on invoice payment for the particular test.

14. REPORTS....Continued

14.3.2 REQUIREMENTS

The Final Test Report, and associated documentation (including photographs) are relied upon as the chronicle of the compliance test. The Final Test Report will be released to the public domain after review and acceptance by the COTR. For these reasons, each final report must be a complete document capable of standing by itself.

The contractor should include detailed descriptions of all compliance test events in report sections 2 through 6 as appropriate. Any events that are not directly associated with the standard but are of technical interest should also be included. The contractor should include as much detail as possible in the report.

Instructions for the preparation of the first three (3) pages of the final test report are provided below for the purpose of standardization.

14.3.3 FIRST THREE PAGES

A. FRONT COVER

A heavy paperback cover (or transparency) shall be provided for the protection of the final report. The information required on the cover is as follows:

(1) Final Report Number such as 206-ABC-20XX-001/00X, where –

206 is the FMVSS tested  
ABC are the initials for the laboratory  
20XX is the Fiscal Year of the test program  
001/00X is the Group Number (001 for the 1st brand longitudinal test, and 00X for the 1st brand transverse test, etc.)

(2) Final Report Title And Subtitle such as:

VEHICLE SAFETY COMPLIANCE TESTING  
FMVSS No. 206, Door Locks and Door Retention Components  
Inertial Load Sled Test  
\*\*\*\*\*  
World Motors Corporation  
20XX Safe Rider 2-door Coupe  
NHTSA No.:  
Sled Test No.: S206I-001/00X

(3) Contractor's Name and Address such as

COMPLIANCE TESTING LABORATORIES, INC.  
4335 West Dearborn Street  
Detroit, Michigan 48090-1234

**14. REPORTS....Continued**

**NOTE:** DOT SYMBOL WILL BE PLACED BETWEEN ITEMS (3) AND (4)

(4) Date of Final Report completion

(5) The words "FINAL REPORT"

(6) The sponsoring agency's name and address as follows

U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Enforcement  
Office of Vehicle Safety Compliance  
Room 6116 (NVS-222)  
400 Seventh Street, SW  
Washington, DC 20590

14. REPORTS....Continued

B. FIRST PAGE AFTER FRONT COVER

A disclaimer statement and an acceptance signature block for the COTR shall be provided as follows:

This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: \_\_\_\_\_

Approved By: \_\_\_\_\_

Approval Date: \_\_\_\_\_

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: \_\_\_\_\_

Acceptance Date: \_\_\_\_\_

## 14. REPORTS....Continued

### C. SECOND PAGE AFTER FRONT COVER

A completed Technical Report Documentation Page (Form DOT F1700.7) shall be completed for those items that are applicable with the other spaces left blank. Sample data for the applicable block numbers of the title page follows.

Block 1 — REPORT NUMBER

206-ABC-20XX-001/00X

Block 2 — GOVERNMENT ACCESSION NUMBER

Leave blank

Block 3 — RECIPIENT'S CATALOG NUMBER

Leave blank

Block 4 — TITLE AND SUBTITLE

Final Report of FMVSS 206 Inertial Load Compliance Testing of Side Door Latches from a 20XX Safe Rider 2-door coupe

Block 5 — REPORT DATE

March 7, 20XX

Block 6 — PERFORMING ORGANIZATION CODE

ABC

Block 7 — AUTHOR(S)

John Smith, Project Manager  
Bill Doe, Project Engineer

Block 8 — PERFORMING ORGANIZATION REPORT NUMBER

206-ABC-20XX-001/00X

**14. REPORTS....Continued**

## Block 9 — PERFORMING ORGANIZATION NAME AND ADDRESS

ABC Laboratories  
405 Main Street  
Detroit, MI 48070-1234

## Block 10 — WORK UNIT NUMBER

Leave blank

## Block 11 — CONTRACT OR GRANT NUMBER

DTNH22-XX-D-12345

## Block 12 — SPONSORING AGENCY NAME AND ADDRESS

U.S. Department of Transportation  
National Highway Traffic Safety Administration  
Enforcement  
Office of Vehicle Safety Compliance (NVS-222)  
400 Seventh Street, SW, Room 6116  
Washington, DC 20590

## Block 13 — TYPE OF REPORT AND PERIOD COVERED

Final Test Report  
Feb. 15 to Mar. 15, 20XX

## Block No. 14 — SPONSORING AGENCY CODE

NVS-222

## Block 15 — SUPPLEMENTARY NOTES

Leave blank

## 14. REPORTS....Continued

### Block 16 — ABSTRACT

Compliance tests were conducted on the subject 20XX Safe Rider 2-door coupe in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-206I-00. Test failures identified were as follows:

None

NOTE: Above wording must be shown with appropriate changes made for a particular compliance test. Any questions should be resolved with the COTR.

### Block 17 — KEY WORDS

FMVSS 206  
Door Locks and Door Retention Components  
Inertial Load Sled Test

### Block 18 — DISTRIBUTION STATEMENT

Copies of this report are available from

National Highway Traffic Safety Administration  
Technical Information Services (NPO-405)  
400 Seventh St., SW, Room 2336  
Washington, DC 20590  
FAX No.: 202-493-2833  
Email: [tis@nhtsa.dot.gov](mailto:tis@nhtsa.dot.gov)

### Block 19 — SECURITY CLASSIFICATION OF REPORT

Unclassified

### Block 20 — SECURITY CLASSIFICATION OF PAGE

Unclassified

### Block 21 — NUMBER OF PAGES

Add appropriate number

## 14. REPORTS....Continued

Block 22 — PRICE

Leave blank

### 14.3.4 TABLE OF CONTENTS

Final test report Table of Contents shall include the following:

#### Section

- 1 Purpose of Compliance Test
- 2 Test Notes / Deviations
- 3 Compliance Test Data Summary
- 4 Vehicle Information
- 5 Test Data Sheets
- 6 Test Failure Description

#### Data Sheets

- 1 Post-Test Fully Latched Assessment and Inspection Data
- 2 Instrumentation Calibration Data
- 3 Camera Locations

#### Appendix (as applicable)

- A Vehicle Longitudinal Sled Test Data
- B Vehicle Longitudinal Sled Test Photographs
- C Vehicle Transverse Sled Test Data
- D Vehicle Transverse Sled Test Photographs
- E Door Only Longitudinal Sled Test Data
- F Door Only Longitudinal Sled Test Photographs
- G Door Only Transverse Sled Test Data
- H Door Only Transverse Sled Test Photographs
- I Door Only Vertical Sled Test Data
- J Door Only Vertical Sled Test Photographs

**NOTE:** Each inertial load test Final Report shall contain the test information and data sheets associated with either the vehicle test or the door only test, as applicable. Each vehicle test Final Report shall contain complete test data for the longitudinal and transverse testing, if both tests are conducted on a vehicle model. Each door only test Final Report shall contain complete test data for all doors and test orientations conducted on a vehicle model.

## 15. REPORT SECTIONS and DATA SHEETS

### SECTION 1

#### PURPOSE OF COMPLIANCE TEST

The tests performed are part of the safety compliance program for the National Highway Traffic Safety Administration (NHTSA) by ABC under Contract No. DTNH22-XX-D-12345. The purpose of the testing is to determine whether door locks on production motor vehicles supplied by NHTSA meet the minimum inertial load test requirements of TP-206I-00, "Door Locks and Door Retention Components, Inertial Load Sled Test." The testing was conducted in accordance with the ABC testing procedure submitted to and approved by NHTSA along with the Office of Vehicle Safety Compliance Test Procedure No. TP-206I-00.

**SECTION 2**  
**TEST NOTES / DEVIATIONS**

Test Vehicle:

Vehicle Longitudinal Test:

Vehicle Transverse Test:

**SECTION 2... (continued)**  
**TEST NOTES / DEVIATIONS**

Test Vehicle and Door(s):

Door Only Longitudinal Test:

Door Only Transverse Test:

Door Only Vertical Test:

**SECTION 3  
COMPLIANCE TEST DATA SUMMARY**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

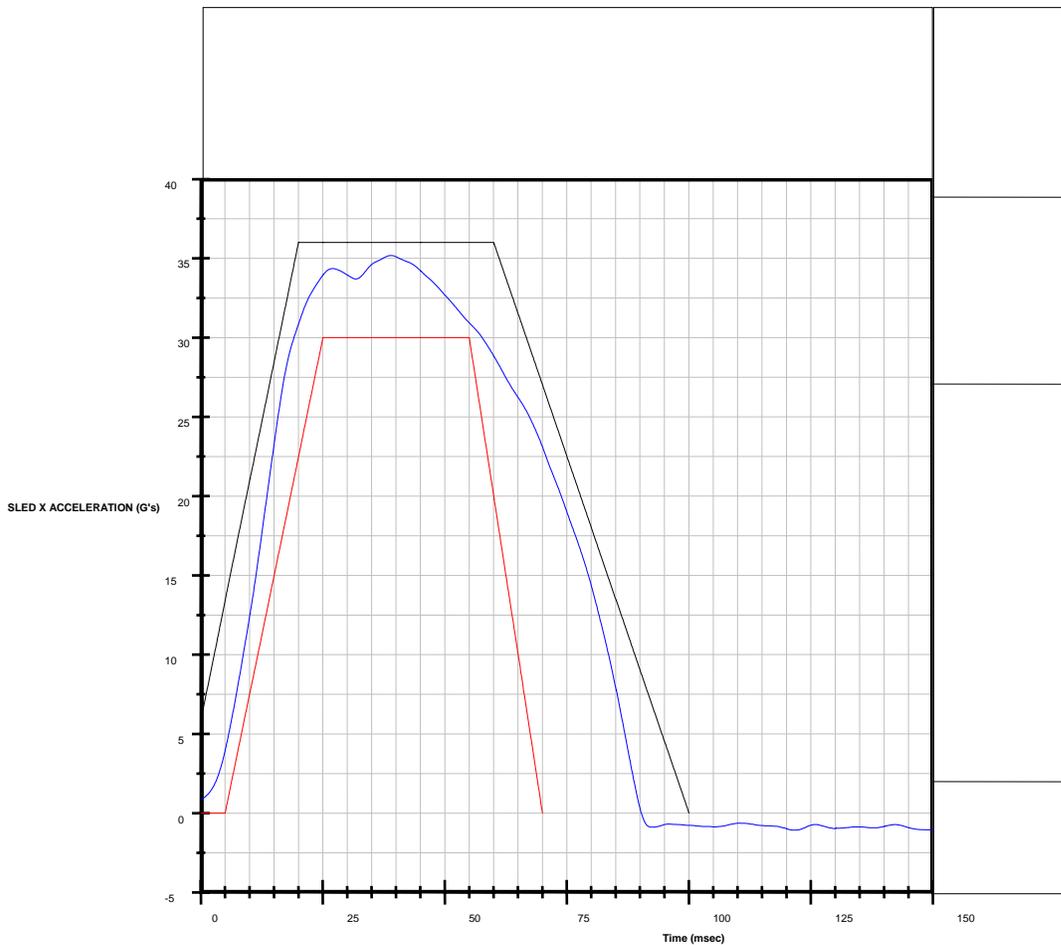
Sled Test No.  
Test Date:

**IMPACT PULSE DATA – VEHICLE LONGITUDINAL TEST**

|                                | Target                 | Actual |
|--------------------------------|------------------------|--------|
| Peak Acceleration (g)          | min. = 30<br>max. = 36 |        |
| Overall Velocity Change (kmph) | N/A                    |        |

| Upper Bound |           |                  | Lower Bound |           |                  |
|-------------|-----------|------------------|-------------|-----------|------------------|
| Point       | Time (ms) | Acceleration (g) | Point       | Time (ms) | Acceleration (g) |
| A           | 0         | 6                | E           | 5         | 0                |
| B           | 20        | 36               | F           | 25        | 30               |
| C           | 60        | 36               | G           | 55        | 30               |
| D           | 100       | 0                | H           | 70        | 0                |

(recorded sled pulse example below)



**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

Test Vehicle:  
 Test Program: FMVSS 206 Compliance

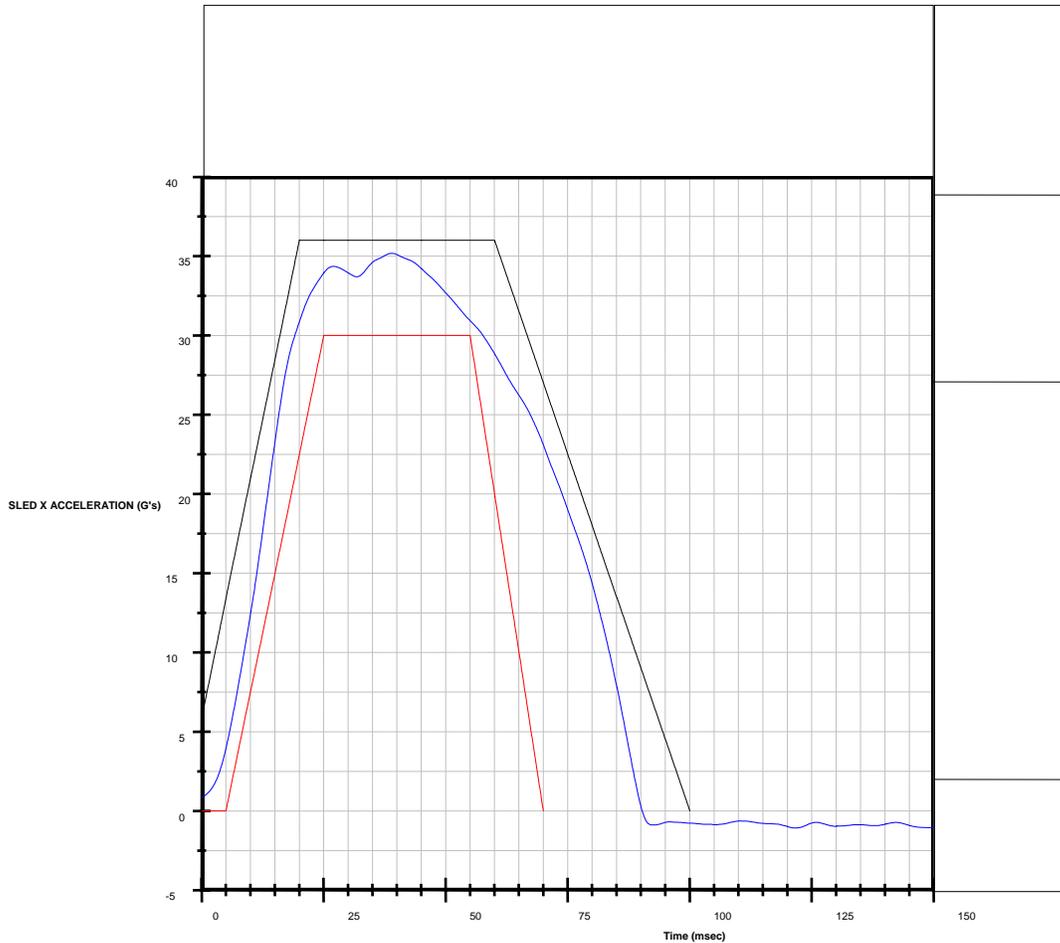
Sled Test No.  
 Test Date:

**IMPACT PULSE DATA – VEHICLE TRANSVERSE TEST**

|                                | Target                 | Actual |
|--------------------------------|------------------------|--------|
| Peak Acceleration (g)          | min. = 30<br>max. = 36 |        |
| Overall Velocity Change (kmph) | N/A                    |        |

| Upper Bound |           |                  | Lower Bound |           |                  |
|-------------|-----------|------------------|-------------|-----------|------------------|
| Point       | Time (ms) | Acceleration (g) | Point       | Time (ms) | Acceleration (g) |
| A           | 0         | 6                | E           | 5         | 0                |
| B           | 20        | 36               | F           | 25        | 30               |
| C           | 60        | 36               | G           | 55        | 30               |
| D           | 100       | 0                | H           | 70        | 0                |

(recorded sled pulse example below)



**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

Test Vehicle and Door(s):  
 Test Program: FMVSS 206 Compliance

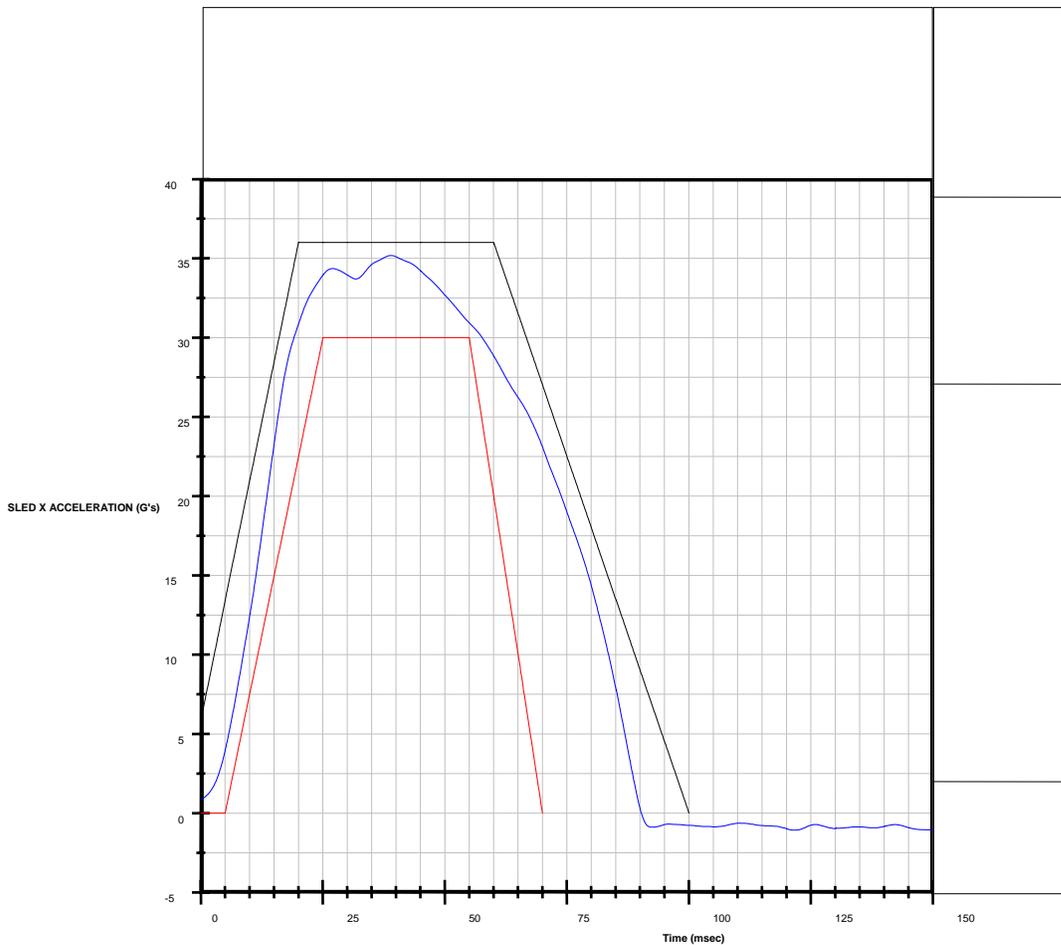
Sled Test No.  
 Test Date:

**IMPACT PULSE DATA – DOOR ONLY LONGITUDINAL TEST**

|                                | Target                 | Actual |
|--------------------------------|------------------------|--------|
| Peak Acceleration (g)          | min. = 30<br>max. = 36 |        |
| Overall Velocity Change (kmph) | N/A                    |        |

| Upper Bound |           |                  | Lower Bound |           |                  |
|-------------|-----------|------------------|-------------|-----------|------------------|
| Point       | Time (ms) | Acceleration (g) | Point       | Time (ms) | Acceleration (g) |
| A           | 0         | 6                | E           | 5         | 0                |
| B           | 20        | 36               | F           | 25        | 30               |
| C           | 60        | 36               | G           | 55        | 30               |
| D           | 100       | 0                | H           | 70        | 0                |

(recorded sled pulse example below)



**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

Test Vehicle and Door(s):  
 Test Program: FMVSS 206 Compliance

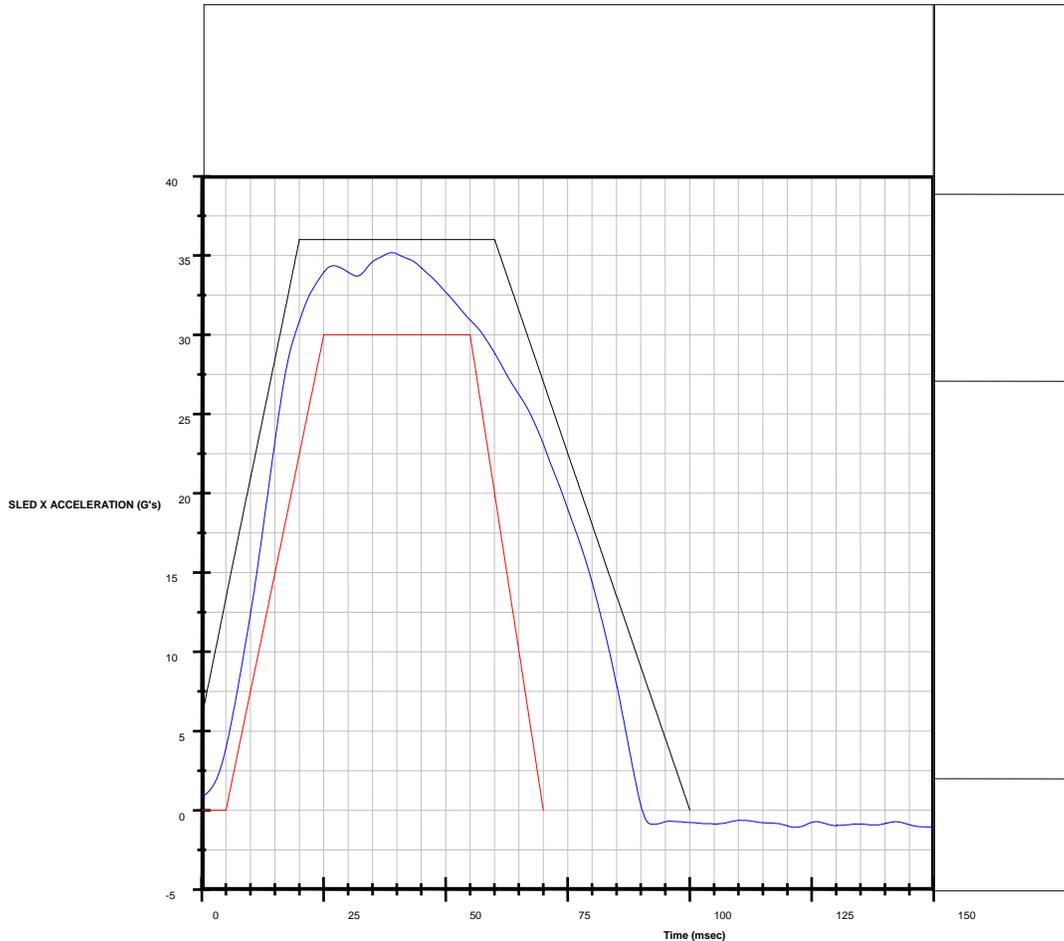
Sled Test No.  
 Test Date:

**IMPACT PULSE DATA – DOOR ONLY TRANSVERSE TEST**

|                                | Target                 | Actual |
|--------------------------------|------------------------|--------|
| Peak Acceleration (g)          | min. = 30<br>max. = 36 |        |
| Overall Velocity Change (kmph) | N/A                    |        |

| Upper Bound |           |                  | Lower Bound |           |                  |
|-------------|-----------|------------------|-------------|-----------|------------------|
| Point       | Time (ms) | Acceleration (g) | Point       | Time (ms) | Acceleration (g) |
| A           | 0         | 6                | E           | 5         | 0                |
| B           | 20        | 36               | F           | 25        | 30               |
| C           | 60        | 36               | G           | 55        | 30               |
| D           | 100       | 0                | H           | 70        | 0                |

(recorded sled pulse example below)



**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

Test Vehicle and Door(s):  
 Test Program: FMVSS 206 Compliance

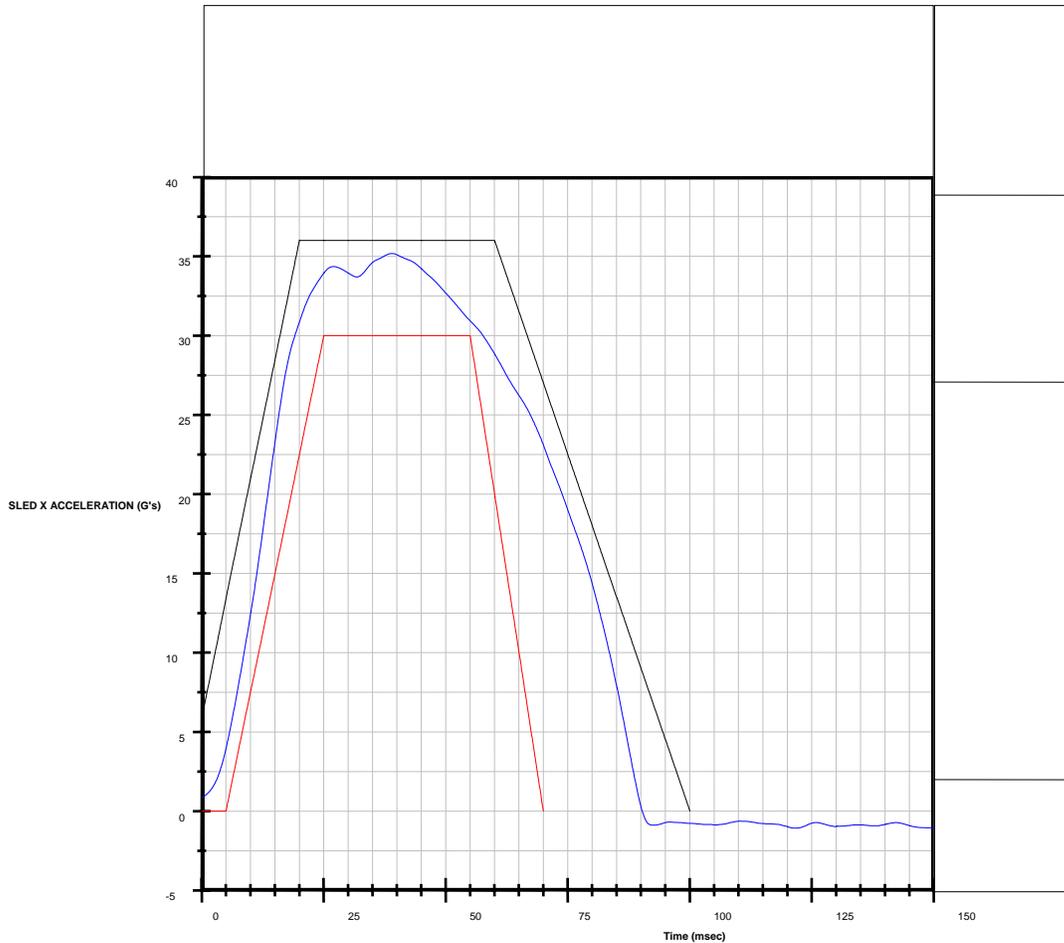
Sled Test No.  
 Test Date:

**IMPACT PULSE DATA – DOOR ONLY VERTICAL TEST**

|                                | Target                 | Actual |
|--------------------------------|------------------------|--------|
| Peak Acceleration (g)          | min. = 30<br>max. = 36 |        |
| Overall Velocity Change (kmph) | N/A                    |        |

| Upper Bound |           |                  | Lower Bound |           |                  |
|-------------|-----------|------------------|-------------|-----------|------------------|
| Point       | Time (ms) | Acceleration (g) | Point       | Time (ms) | Acceleration (g) |
| A           | 0         | 6                | E           | 5         | 0                |
| B           | 20        | 36               | F           | 25        | 30               |
| C           | 60        | 36               | G           | 55        | 30               |
| D           | 100       | 0                | H           | 70        | 0                |

(recorded sled pulse example below)



**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

**AMBIENT TEMPERATURE AND HUMIDITY**  
**(Date) – VEHICLE LONGITUDINAL TEST**  
**Time of Test - (time)**

(Plot – Temperature/Time History)

**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

**AMBIENT TEMPERATURE AND HUMIDITY**

**(Date) – VEHICLE TRANSVERSE TEST**

**Time of Test – (time)**

(Plot – Temperature/Time History)

**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

**AMBIENT TEMPERATURE AND HUMIDITY**  
**(Date) – DOOR ONLY LONGITUDINAL TEST**  
**Time of Test – (time)**

(Plot – Temperature/Time History)

**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

**AMBIENT TEMPERATURE AND HUMIDITY**  
**(Date) – DOOR ONLY TRANSVERSE TEST**  
**Time of Test – (time)**

(Plot – Temperature/Time History)

**SECTION 3...(continued)**  
**COMPLIANCE TEST DATA SUMMARY**

**AMBIENT TEMPERATURE AND HUMIDITY**

**(Date) – DOOR ONLY VERTICAL TEST**

**Time of Test – (time)**

(Plot – Temperature/Time History)

**SECTION 3...(continued)  
COMPLIANCE TEST DATA SUMMARY**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

Sled Test Nos.  
Test Dates:

**Post-Test Fully Latched Assessment for Vehicle Longitudinal Test**

| VEHICLE LATCH LOCATION | FAILURE MODE | PASS/FAIL |
|------------------------|--------------|-----------|
|                        |              |           |
|                        |              |           |
|                        |              |           |
|                        |              |           |
|                        |              |           |

**Post-Test Fully Latched Assessment for Vehicle Transverse Test**

| VEHICLE LATCH LOCATION | FAILURE MODE | PASS/FAIL |
|------------------------|--------------|-----------|
|                        |              |           |
|                        |              |           |
|                        |              |           |
|                        |              |           |
|                        |              |           |

Remarks:

**SECTION 3...(continued)  
COMPLIANCE TEST DATA SUMMARY**

Test Vehicle & Door(s):  
Test Program: FMVSS 206 Compliance

Sled Test Nos.  
Test Dates:

**Post-Test Fully Latched Inspection Assessment for Door Only Longitudinal Test**

| Door | FAILURE MODE | PASS/FAIL |
|------|--------------|-----------|
|      |              |           |

**Post-Test Fully Latched Inspection Assessment for Door Only Transverse Test**

| Door | FAILURE MODE | PASS/FAIL |
|------|--------------|-----------|
|      |              |           |

**Post-Test Fully Latched Inspection Assessment for Door Only Vertical Test**

| Door | FAILURE MODE | PASS/FAIL |
|------|--------------|-----------|
|      |              |           |

Remarks:

**SECTION 4**  
**VEHICLE INFORMATION**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

Sled Test No.  
Test Date:

| <b>CERTIFICATION LABEL</b>                      |  |
|---|--|
| Vehicle Manufacturer:                           |  |
| Vehicle Make/Model:                             |  |
| Date of Manufacture:                            |  |
| VIN:  |  |
| NHTSA No.:                                      |  |
| Vehicle Certified As (Pass. Car/MPV/Truck/Bus): |  |
| Front Axle GAWR:                                |  |
| Rear Axle GAWR:                                 |  |
| Total GVWR:                                     |  |

**SECTION 4... (continued)**  
**VEHICLE INFORMATION**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

Sled Test No.  
Test Date:

**TEST VEHICLE ATTITUDES – VEHICLE LONGITUDINAL TEST**

|                               | Units | As Delivered | Fully Loaded | Ready For Test* |
|-------------------------------|-------|--------------|--------------|-----------------|
| Driver Door Sill Angle        | deg   |              |              |                 |
| Left Front Wheel Well Height  | mm    |              |              |                 |
| Right Front Wheel Well Height | mm    |              |              |                 |

\*on sled buck

**TEST WEIGHT – VEHICLE LONGITUDINAL TEST**

| Measured Parameter           | Units | Value |
|------------------------------|-------|-------|
| Total Delivered Weight (UVW) | Kg    |       |
| Weight of Test Buck          | Kg    |       |
| Test Weight on Sled Carriage | Kg    |       |

List of vehicle components removed (vehicle longitudinal test):

Remarks:

**SECTION 4...(continued)  
VEHICLE INFORMATION**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

Sled Test No.  
Test Date:

**TEST VEHICLE ATTITUDES – VEHICLE TRANSVERSE TEST**

|                               | Units | As Delivered | Fully Loaded | Ready For Test* |
|-------------------------------|-------|--------------|--------------|-----------------|
| Driver Door Sill Angle        | deg   |              |              |                 |
| Left Front Wheel Well Height  | mm    |              |              |                 |
| Right Front Wheel Well Height | mm    |              |              |                 |

\*on sled buck

**TEST WEIGHT – VEHICLE TRANSVERSE TEST**

| Measured Parameter           | Units | Value |
|------------------------------|-------|-------|
| Total Delivered Weight (UVW) | Kg    |       |
| Weight of Test Buck          | Kg    |       |
| Test Weight on Sled Carriage | Kg    |       |

List of vehicle components removed (vehicle transverse test):

Remarks:

**SECTION 4...(continued)  
VEHICLE INFORMATION**

Test Vehicle and Door(s):  
Test Program:

FMVSS 206 Compliance

Sled Test No.  
Test Date:

**TEST VEHICLE ATTITUDES – DOOR ONLY TEST**

|                               | Units | As Delivered | Fully Loaded | Ready for Measurements* |
|-------------------------------|-------|--------------|--------------|-------------------------|
| Driver Door Sill Angle        | deg   |              |              |                         |
| Left Front Wheel Well Height  | mm    |              |              |                         |
| Right Front Wheel Well Height | mm    |              |              |                         |

\*ready for hinge and striker mounting point location measurements.

**TEST WEIGHT – DOOR ONLY LONGITUDINAL TEST**

| Measured Parameter           | Units | Value |
|------------------------------|-------|-------|
| Door subassembly Weight      | Kg    |       |
| Weight of Test Buck          | Kg    |       |
| Test Weight on Sled Carriage | Kg    |       |

**TEST WEIGHT – DOOR ONLY TRANSVERSE TEST**

| Measured Parameter           | Units | Value |
|------------------------------|-------|-------|
| Door subassembly Weight      | Kg    |       |
| Weight of Test Buck          | Kg    |       |
| Test Weight on Sled Carriage | Kg    |       |

**TEST WEIGHT – DOOR ONLY VERTICAL TEST**

| Measured Parameter           | Units | Value |
|------------------------------|-------|-------|
| Door subassembly Weight      | Kg    |       |
| Weight of Test Buck          | Kg    |       |
| Test Weight on Sled Carriage | Kg    |       |

Remarks:

**SECTION 5  
TEST DATA**

**DATA SHEET NO. 1  
POST-TEST DOOR FULLY LATCHED ASSESSMENT**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

Sled Test Nos.  
Test Dates:

**Visual Inspection and High Speed Video Observations for Vehicle Longitudinal Test**

| VEHICLE DOOR LOCATION | Visual Inspection | H.S. Video Observations | PASS/ FAIL |
|-----------------------|-------------------|-------------------------|------------|
|                       |                   |                         |            |
|                       |                   |                         |            |
|                       |                   |                         |            |
|                       |                   |                         |            |

**Visual Inspection and High Speed Video Observations for Vehicle Transverse Test**

| VEHICLE DOOR LOCATION | Visual Inspection | H.S. Video Observations | PASS/ FAIL |
|-----------------------|-------------------|-------------------------|------------|
|                       |                   |                         |            |
|                       |                   |                         |            |
|                       |                   |                         |            |
|                       |                   |                         |            |

Remarks:

**SECTION 5... (continued)**

**TEST DATA**

**DATA SHEET NO. 1...(continued)**

**POST-TEST DOOR FULLY LATCHED ASSESSMENT**

Test Vehicle & Door(s):  
 Test Program:

FMVSS 206 Compliance

Sled Test Nos.  
 Test Dates:

**Visual Inspection and High Speed Video Observations for Door Only Longitudinal Test**

| DOOR | Visual Inspection | H.S. Video Observations | PASS/ FAIL |
|------|-------------------|-------------------------|------------|
|      |                   |                         |            |

**Visual Inspection and High Speed Video Observations for Door Only Transverse Test**

| DOOR | Visual Inspection | H.S. Video Observations | PASS/ FAIL |
|------|-------------------|-------------------------|------------|
|      |                   |                         |            |

**Visual Inspection and High Speed Video Observations for Door Only Vertical Test**

| DOOR | Visual Inspection | H.S. Video Observations | PASS/ FAIL |
|------|-------------------|-------------------------|------------|
|      |                   |                         |            |

Remarks:

## SECTION 5...(continued)

## TEST DATA

## DATA SHEET NO. 1...(continued)

## VEHICLE POST TEST DOOR FULLY LATCHED ASSESSMENT

Test Vehicle:  
 Test Program: FMVSS 206 Compliance

Sled Test Nos.  
 Test Dates:

## Applied Force Assessment for Vehicle Longitudinal Test

| LATCH LOCATION            | APPLIED TEST LOAD (N) | REQUIRED LOAD (N) | FAILURE MODE* | PASS/ FAIL |
|---------------------------|-----------------------|-------------------|---------------|------------|
| Driver Door               |                       | 270 ±10           |               |            |
| Passenger Door            |                       | 270 ±10           |               |            |
| Left Rear Passenger Door  |                       | 270 ±10           |               |            |
| Right Rear Passenger Door |                       | 270 ±10           |               |            |
| Rear Hatch                |                       | 270 ±10           |               |            |
| Left Side Sliding Door    |                       | 270 ±10           |               |            |
| Right Side Sliding Door   |                       | 270 ±10           |               |            |

## Applied Force Assessment for Vehicle Transverse Test

| LATCH LOCATION            | APPLIED TEST LOAD (N) | REQUIRED LOAD (N) | FAILURE MODE* | PASS/ FAIL |
|---------------------------|-----------------------|-------------------|---------------|------------|
| Driver Door               |                       | 270 ±10           |               |            |
| Passenger Door            |                       | 270 ±10           |               |            |
| Left Rear Passenger Door  |                       | 270 ±10           |               |            |
| Right Rear Passenger Door |                       | 270 ±10           |               |            |
| Rear Hatch                |                       | 270 ±10           |               |            |
| Left Side Sliding Door    |                       | 270 ±10           |               |            |
| Right Side Sliding Door   |                       | 270 ±10           |               |            |

\* FAILURE MODE shall only apply when load requirements are NOT met.

Remarks:

Recorded by: \_\_\_\_\_

Date: \_\_\_\_\_

Approved by: \_\_\_\_\_

SECTION 5...(continued)

TEST DATA

DATA SHEET 2

INSTRUMENTATION CALIBRATION DATA

VEHICLE LONGITUDINAL TEST

Test Vehicle:

Sled Test No.

Test Program: FMVSS 206 Compliance

Test Date:

| Location              | Manuf. | Calibration Date | S/N | Limits | Accuracy | Cal. Freq. | Cal. Exp. |
|-----------------------|--------|------------------|-----|--------|----------|------------|-----------|
| Sled Accelerometer X  |        |                  |     |        |          |            |           |
| Sled Accelerometer Xr |        |                  |     |        |          |            |           |

VEHICLE TRANSVERSE TEST

Test Vehicle:

Sled Test No.

Test Program: FMVSS 206 Compliance

Test Date:

| Location              | Manuf. | Calibration Date | S/N | Limits | Accuracy | Cal. Freq. | Cal. Exp. |
|-----------------------|--------|------------------|-----|--------|----------|------------|-----------|
| Sled Accelerometer X  |        |                  |     |        |          |            |           |
| Sled Accelerometer Xr |        |                  |     |        |          |            |           |

Remarks:

Recorded by: \_\_\_\_\_

Date: \_\_\_\_\_

Approved by: \_\_\_\_\_

SECTION 5...(continued)

TEST DATA

DATA SHEET 2...(continued)

INSTRUMENTATION CALIBRATION DATA

DOOR ONLY LONGITUDINAL TEST

Test Vehicle and Door(s):  
Test Program:

FMVSS 206 Compliance

Sled Test No.  
Test Date:

| Location              | Manuf. | Calibration Date | S/N | Limits | Accuracy | Cal. Freq. | Cal. Exp. |
|-----------------------|--------|------------------|-----|--------|----------|------------|-----------|
| Sled Accelerometer X  |        |                  |     |        |          |            |           |
| Sled Accelerometer Xr |        |                  |     |        |          |            |           |

DOOR ONLY TRANSVERSE TEST

Test Vehicle and Door(s):  
Test Program:

FMVSS 206 Compliance

Sled Test No.  
Test Date:

| Location              | Manuf. | Calibration Date | S/N | Limits | Accuracy | Cal. Freq. | Cal. Exp. |
|-----------------------|--------|------------------|-----|--------|----------|------------|-----------|
| Sled Accelerometer X  |        |                  |     |        |          |            |           |
| Sled Accelerometer Xr |        |                  |     |        |          |            |           |

DOOR ONLY VERTICAL TEST

Test Vehicle and Door(s):  
Test Program:

FMVSS 206 Compliance

Sled Test No.  
Test Date:

| Location              | Manuf. | Calibration Date | S/N | Limits | Accuracy | Cal. Freq. | Cal. Exp. |
|-----------------------|--------|------------------|-----|--------|----------|------------|-----------|
| Sled Accelerometer X  |        |                  |     |        |          |            |           |
| Sled Accelerometer Xr |        |                  |     |        |          |            |           |

Remarks:

Recorded by: \_\_\_\_\_

Date: \_\_\_\_\_

Approved by: \_\_\_\_\_

**SECTION 5...(continued)**  
**TEST DATA**

**DATA SHEET NO. 3**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

Sled Test No.  
Test Date:

**CAMERA LOCATIONS – VEHICLE LONGITUDINAL TEST**

| CAMERA NO. | VIEW | LENS (mm) | SPEED (fps) |
|------------|------|-----------|-------------|
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |

(sled test camera diagram)

**SECTION 5...(continued)**

**TEST DATA**

**DATA SHEET NO. 3...(continued)**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

Sled Test No.  
Test Date:

**CAMERA LOCATIONS – VEHICLE TRANSVERSE TEST**

| CAMERA NO. | VIEW | LENS (mm) | SPEED (fps) |
|------------|------|-----------|-------------|
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |

(sled test camera diagram)

SECTION 5...(continued)

TEST DATA

DATA SHEET NO. 3...(continued)

Test Vehicle and Door(s):

Sled Test No.

Test Program:

FMVSS 206 Compliance

Test Date:

CAMERA LOCATIONS – DOOR ONLY LONGITUDINAL TEST

| CAMERA NO. | VIEW | LENS (mm) | SPEED (fps) |
|------------|------|-----------|-------------|
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |

CAMERA LOCATIONS – DOOR ONLY TRANSVERSE TEST

| CAMERA NO. | VIEW | LENS (mm) | SPEED (fps) |
|------------|------|-----------|-------------|
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |

CAMERA LOCATIONS – DOOR ONLY VERTICAL TEST

| CAMERA NO. | VIEW | LENS (mm) | SPEED (fps) |
|------------|------|-----------|-------------|
|            |      |           |             |
|            |      |           |             |
|            |      |           |             |

(sled test camera diagram for each test as applicable)

Remarks:

Recorded by: \_\_\_\_\_

Date: \_\_\_\_\_

Approved by: \_\_\_\_\_

**SECTION 6**  
**TEST FAILURE DESCRIPTION**

Test Vehicle:  
Test Program: FMVSS 206 Compliance

Sled Test Nos.  
Test Dates:

**VEHICLE LONGITUDINAL TEST:**

**VEHICLE TRANSVERSE TEST:**

**SECTION 6...(continued)**  
**TEST FAILURE DESCRIPTION**

Test Vehicle & Door(s):  
Test Program: FMVSS 206 Compliance

Sled Test Nos.  
Test Dates:

**DOOR ONLY LONGITUDINAL TEST:**

**DOOR ONLY TRANSVERSE TEST:**

**DOOR ONLY VERTICAL TEST:**

16. FORMS

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS 206

TEST DATE: \_\_\_\_\_

LABORATORY: \_\_\_\_\_

CONTRACT NO.: \_\_\_\_\_; DELV. ORDER NO: \_\_\_\_\_

LABORATORY PROJECT ENGINEER'S NAME: \_\_\_\_\_

VEHICLE MANUFACTURER: \_\_\_\_\_

VEHICLE MAKE, MODEL, AND YEAR: \_\_\_\_\_

TEST FAILURE DESCRIPTION: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FMVSS REQUIREMENT, PARAGRAPH: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NOTIFICATION TO NHTSA (COTR): \_\_\_\_\_

DATE: \_\_\_\_\_ BY: \_\_\_\_\_

REMARKS:

16. FORMS....Continued

MONTHLY REPORT  
VEHICLE INERTIAL LOAD TEST  
FMVSS No. 206

| NHTSA No. | Vehicle Manufacturer | Vehicle Make/Model | Date Received | Date Test/Preparation Started | Date Test Completed | Report Sent Date |
|-----------|----------------------|--------------------|---------------|-------------------------------|---------------------|------------------|
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |
|           |                      |                    |               |                               |                     |                  |

REMARKS: